

WHAT IS CLAIMED IS:

1. A method for preparation of tips for scanning probe microscopy which comprises:

a) transferring adhesive from carbon tape to a microfabricated Si tip; and

b) pulling off bundles of a transition metal chalcogenide nanotubes with said tip from a mat of long nanotubes prepared on a different area of the tape,

wherein said long nanotubes have a size of 0.2-20 μm or greater, and are obtained by bulk synthesis of long nanotubes of transition metal chalcogenides from a transition metal material, water vapor and H_2X gas or H_2 gas and X vapor, wherein X is S, Se or Te and synthesis, comprising:

a) either heating a transition metal material in the presence of water vapor in a vacuum apparatus or electron beam evaporating a transition metal material in the presence of water vapor, at a preselected pressure, to obtain nanoparticles of the transition metal oxide as long as 0.3 microns; and

b) annealing the transition metal oxide nanoparticles obtained in step (a) in a mild reducing atmosphere with a H_2X gas or H_2 gas and X vapor, wherein X is S, Se or Te, at a suitable temperature, thus obtaining said long nanotubes of the transition metal chalcogenide, said nanotubes.

2. A method according to claim 1, wherein said transition metal chalcogenide is WS_2 and/or WSe_2 .